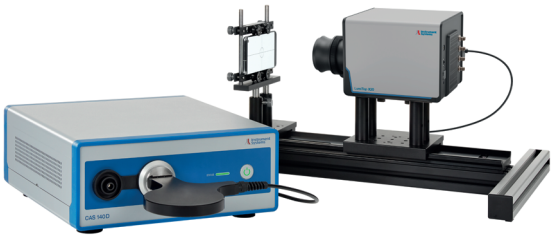
Instrument Systems
KONICA MINOLTA Group

LumiTop X20

Spectrally enhanced imaging colorimeter

Key features at a glance

- CMOS camera with 20 megapixels
- Proven concept of LumiTop – spectrally enhanced imaging colorimeter
- Enhanced dynamics from mcd/m² to Mcd/m²
- High flexibility in field of view by high-precision motorized lens (optional)
- Combination of 2D-RGB sensor with spectroradiometer and flicker sensor



\\ TECHNICAL SPECIFICATIONS

LumiTop X20		
Measurement quantities		
2D	Luminance, color	
Spot	Spectrum, luminance, color, flicker	
General specifications		
Operating system	Windows 10 (64 bit), Windows 11 (64 bit)	
Dimensions (l x w x h) [1]	360 mm x 280 mm x 190 mm	
Weight [2]	7.5 kg	
Power supply	24 V	
Operating temperature range	15 – 35 °C	

Camera specifications		
Effective resolution (h x v)	5496 x 3672 pixels (20 megapixels, CMOS)	
Pixel size	2.4 µm x 2.4 µm	
AD converter	12 bit	
Size sensor	15.9 mm diagonal	
Interface camera	1 Gigabit Ethernet	
Accuracy and precision	**Luminance**	**Color**
Accuracy of camera (rel. to CAS) [3]	±0.45 %	±0.002
Instrumental precision camera [4]	±0.04 %	±0.0002
Camera uniformity (RNU) [5]	±0.35 %	±0.0013
Measurement range		
Min./max. luminance [6]	0.002 cd/m² – 1,000,000 cd/m²	
Max. luminance @ 60 Hz frame rate [7]	5000 cd/m²	
Measurement time [8]		
Measurement time hybrid mode	1.35 s	
Measurement time camera only	0.9 s	

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\\ TECHNICAL SPECIFICATIONS

CAS specifications	**CAS 140D**	
Interface CAS	USB, PCIe, Gigabit Ethernet	
Measurement range CAS [9]	L_{min} < 0.001 cd/m²	
Accuracy and precision	**Luminance**	**Color**
Accuracy of CAS	±3.0 % [10]	±0.0015 [11]
Instrumental precision CAS [4]	±0.1 %	±0.0001
Polarization sensitivity [12]	±2.0 %	±0.002

Spot size and field of view at selected working distances for 25 mm lens (f/1.4)							
Working distances [mm] [13]	**300**	**400**	**500**	**700**	**1000**	**1200**	**1400**
Spot size [mm]	8.3	12.2	16.1	24	35.7	43.6	51.4
Field of view [mm]	112 x 74	165 x 109	218 x 144	324 x 213	484 x 318	590 x 388	696 x 458
Field of view diagonal [in]	5.3	7.8	10.3	15.3	22.8	27.8	32.8

Spot size and field of view at selected working distances for 35 mm lens (f/1.4)							
Working distances [mm] [13]	**300**	**400**	**500**	**700**	**1000**	**1200**	**1400**
Spot size [mm]	6.6	9.6	12.5	18.4	27.2	33.1	39
Field of view [mm]	90 x 59	129 x 85	169 x 111	249 x 164	368 x 242	448 x 295	527 x 347
Field of view diagonal [in]	4.2	6.1	8	11.7	17.4	21.1	24.9

Spot size and field of view at selected working distances for 50 mm lens (f/1.4)							
Working distances [mm] [13]	**300**	**400**	**500**	**700**	**1000**	**1200**	**1400**
Spot size [mm]	4.6	6.6	8.7	12.8	18.9	23	27.1
Field of view [mm]	62 x 41	90 x 59	118 x 77	173 x 114	256 x 169	312 x 205	367 x 242
Field of view diagonal [in]	2.9	4.2	5.5	16.8	12.1	14.7	17.3

[1] Inclusive lens and fiber exit.
[2] Without CAS, with mode mixer.
[3] Typical value f or maximum deviation over the FOV relative to the CAS spot
[4] 2σ of repeated measurements of one instrument (L ≈ 100 cd/m², autoexposure).
[5] RNU (response non-uniformity) is defined as 99.7 % percentile of the deviation of the mean image value.
[6] Lower measurement limit based on a signal to noise ratio of 10:1 for exposure time of 10 seconds. Upper measurement limit based on a signal level < 80 % for a white (non-modulated) LED light source using for minimum exposure time of 21 µs.
[7] Measurement with 16.666 ms exposure time synchronized to display frame rate.
[8] Time between the beginning of two subsequent measurements using the SDK; determined with a camera exposure time of 20 ms and CAS exposure time of 200 ms for a white LED (L ≈ 500 cd/m²). Depends mainly on PC processing capability.
[9] Lower measurement limit based on a signal to noise ratio of 10:1 for maximum exposure times 65 s for CAS 140D with 250 µm slit width.
[10] Immediately after calibration relative to calibration standard.
[11] Immediately after calibration.
[12] Maximum deviation from average of repeated CAS measurements with a linear polarized light source and varying polarization angle.
[13] Distance between DUT and front plate of LumiTop.

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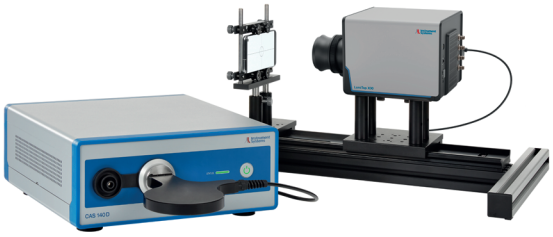
LumiTop X30

Spectrally enhanced imaging colorimeter

Key features at a glance

- Cooled CMOS camera with 31 megapixels and global shutter
- Proven concept of LumiTop – spectrally enhanced imaging colorimeter
- Enhanced dynamics from mcd/m² to Mcd/m²
- High flexibility in field of view by high-precision motorized lens (optional)
- Combination of 2D-RGB sensor with spectroradiometer and flicker sensor



\\ TECHNICAL SPECIFICATIONS

LumiTop X30		
Measurement quantities		
2D	Luminance, color	
Spot	Spectrum, luminance, color, flicker	
General specifications		
Operating system	Windows 10 (64 bit), Windows 11 (64 bit)	
Dimensions (l x w x h) [1]	360 mm x 280 mm x 190 mm	
Weight [2]	7.5 kg	
Power supply	24 V	
Operating temperature range	15 – 35 °C	

Camera specifications		
Effective resolution (h x v)	6464 x 4852 pixels (31 megapixels, CMOS)	
Pixel size	3.45 µm x 3.45 µm	
AD converter	12 bit	
Size sensor	27.9 mm diagonal (APS-C)	
Interface camera	CoaXPress	
Accuracy and precision	**Luminance**	**Color**
Accuracy of camera (rel. to CAS) [3]	±0.4 %	±0.0015
Instrumental precision camera [4]	±0.03 %	±0.0001
Camera uniformity (RNU) [5]	±0.25 %	±0.001
Measurement range		
Min./max. luminance [6]	0.001 cd/m² – 1,000,000 cd/m²	
Max. luminance @ 60 Hz frame rate [7]	5000 cd/m²	
Measurement time [8]		
Measurement time hybrid mode	1.0 s	
Measurement time camera only	0.4 s	

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CAS specifications	**CAS 140D**	
Interface CAS	USB, PCIe, Gigabit Ethernet	
Measurement range CAS [9]	L_{min} < 0.001 cd/m²	
Accuracy and precision	**Luminance**	**Color**
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Spot size and field of view at selected working distances for 25 mm lens (f/1.4)							
Working distances [mm] [13]	**300**	**400**	**500**	**700**	**1000**	**1200**	**1400**
Spot size [mm]	8.3	12.2	16.1	24	35.7	43.6	51.4
Field of view [mm]	185 x 139	272 x 204	360 x 270	535 x 401	797 x 598	972 x 729	1146 x 861
Field of view diagonal [in]	9.1	13.4	17.7	26.3	39.2	47.8	56.4

Spot size and field of view at selected working distances for 35 mm lens (f/1.4)							
Working distances [mm] [13]	**300**	**400**	**500**	**700**	**1000**	**1200**	**1400**
Spot size [mm]	6.6	9.6	12.5	18.4	27.2	33.1	39
Field of view [mm]	148 x 111	213 x 160	279 x 209	410 x 308	607 x 455	738 x 554	869 x 652
Field of view diagonal [in]	7.3	10.5	13.7	20.2	29.9	36.3	42.8

Spot size and field of view at selected working distances for 50 mm lens (f/1.4)							
Working distances [mm] [13]	**300**	**400**	**500**	**700**	**1000**	**1200**	**1400**
Spot size [mm]	4.6	6.6	8.7	12.8	18.9	23	27.1
Field of view [mm]	103 x 77	148 x 111	194 x 146	285 x 214	423 x 317	514 x 386	605 x 454
Field of view diagonal [in]	5	7.3	9.5	14	20.8	25.3	29.8

[1] Inclusive lens and fiber exit.
[2] Without CAS, with mode mixer.
[3] Typical value f or maximum deviation over the FOV relative to the CAS spot
[4] 2σ of repeated measurements of one instrument (L ≈ 100 cd/m², autoexposure).
[5] RNU (response non-uniformity) is defined as 99.7 % percentile of the deviation of the mean image value.
[6] Lower measurement limit based on a signal to noise ratio of 10:1 for exposure time of 10 seconds. Upper measurement limit based on a signal level < 80 % for a white (non-modulated) LED light source using for minimum exposure time of 21 µs.
[7] Measurement with 16.666 ms exposure time synchronized to display frame rate.
[8] Time between the beginning of two subsequent measurements using the SDK; determined with a camera exposure time of 20 ms and CAS exposure time of 200 ms for a white LED (L ≈ 500 cd/m²). Depends mainly on PC processing capability.
[9] Lower measurement limit based on a signal to noise ratio of 10:1 for maximum exposure times 65 s for CAS 140D with 250 µm slit width.
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